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chain and branched alkyl groups, cycloalkyl groups, substituted and unsubstituted aryl groups, and mixtures thereof, and mixtures thereof; and wherein the inorganic dielectric composition film comprises an inorganic dielectric selected from the group consisting of hydrogensiloxanes, inorganic hydrogensilsesquioxanes and combinations thereof; and wherein the hydrogensiloxanes have the formula $[(HSiO_{1.5})_xO_y]_n$, and the hydrogensilsesquioxanes have the formula $(HSiO_{1.5})_n$, wherein $x =$ about 6 to about 20, $y =$ 1 to about 3, and $n =$ 1 to about 4,000.

REMARKS

Claims 23-31 have been rejected under 35 U.S.C. 102(e) over U.S. patent 6,207,555 to Ross. It is respectfully submitted that the rejection is improper. Due to the filing of the Continued Prosecution Application (CPA) on May 30, 2002, the present application takes the benefit of the AIPA and must be examined as having been filed subsequent to November 29, 2000. The present application and the Ross reference were copending and were subject to an obligation of assignment to the same party namely AlliedSignal Inc. Although Ross, et al is assigned to Electron Vision Corporation, at the time the invention was made it was under an obligation of assignment to AlliedSignal Inc. (Electron Vision group).

The Examiner has stated that the changes made to 35 U.S.C. 102(e) by the AIPA do not apply because the application was not filed on or after November 29, 1999. This is incorrect. It is specifically set forth in 37 C.F.R. 1.53(d)(2) that the filing date of a continued prosecution application is the date on which a request for a

CPA is filed under this section. Accordingly, Applicants are entitled to the filing of May 30, 2002 which henceforth entitles the present application to the protections established by the AIPA of 1999. Since the changes made by the AIPA now apply, U.S. patent 6,207,555 to Ross is not available as prior art to this application and the rejection should be withdrawn.

Even though Ross is not available as a reference, Applicants respectfully submit that Ross still does not describe the invention. Particularly, Ross does not specifically describe a structure wherein an organic dielectric layer is on a surface of a substrate between metal contact lines, and having an inorganic dielectric layer on the organic layer. To be sure, Ross does describe a structure having a multiple dielectric layers which may comprise any of a wide variety of inorganic or organic materials. However, such a broad disclosure does not specifically describe the invention claimed by Applicants. More particularly, the broad disclosure of Ross does not describe a structure which comprises an organic layer as set forth in the amended claims; and an inorganic layer on the organic layer. Nor does Ross describe a structure having a first dielectric composition film on a surface of a substrate; and a second dielectric composition film on the first dielectric composition film; wherein the first dielectric composition and the second dielectric composition have substantially different etch resistance; wherein when the first dielectric composition film is organic then the second dielectric composition film is inorganic; or when the first dielectric composition film is inorganic then the second dielectric composition film is organic.

The examiner states that layer 4 of Ross is an organic layer between metal lines, and that layers 14, 26 and 28 are inorganic layers on the organic layer. Applicants respectfully assert that Ross does not describe with particularity such an

embodiment. Rather, Ross teaches that each of their dielectric layers may comprise any of a wide variety of materials. Additionally, while Ross does mention that it is preferred that the first and second dielectric layers be different than each other, this does not describe the condition that one dielectric layer must be organic while the other layer is inorganic. Indeed, their first and second dielectric layers may comprise two different inorganic materials, or two different organic materials. For example, each of Examples 2, 3 and 4 of Ross describe structures having multiple layers of organic dielectric materials. Specifically, Example 2 describes a structure having a film of an Accuglass® T-11 polymer on a substrate, and a layer of a poly(arylene ether) on the T-11 polymer. Each of these are organic materials. Accuglass® T-11 polymers are a family of methylsiloxane polymers that are commercially available from Honeywell International Inc (formerly AlliedSignal Inc.). In Example 3, the layers are reversed with the poly(arylene ether) layer directly on the substrate and the T-11 polymer deposited onto its surface. Example 4, describes a three organic layered structure on a substrate having a first poly(arylene ether) layer/T-11 polymer/second poly(arylene ether) layer on the substrate. Example 1 shows an embodiment having only a single layer of a poly(arylene ether) on a substrate.

As clearly exhibited by these Examples, Ross does not specifically describe a structure having an organic dielectric layer on a substrate surface and an inorganic dielectric layer on the organic dielectric layer, as claimed by Applicants. The stated preference in Ross that their second dielectric material be different than their first dielectric material, coupled with their long list of available inorganic and organic dielectric materials, is not sufficient to support a conclusion that one of the layers could or should be organic while the other could or should be inorganic. There is simply nothing in Ross that describes the claimed invention,

nor that one could or should selectively choose an organic material as Ross' first dielectric and an inorganic material as Ross' second dielectric, let alone choose the specific dielectrics required by the claims.

Therefore, it is respectfully asserted that Ross fails to teach or describe the claimed invention. For these reasons, it is requested that the rejection be withdrawn.

Claims 23-25 and 28-30 stand rejected under 35 U.S.C. 102 (e) as being anticipated by U.S. patent 6,278,174 to Havemann et al. It is respectfully submitted that the rejection has been overcome by the instant amendment. Claims 23 and 29 have been amended to include the specific organic dielectric materials preferred for the organic dielectric layer. Havemann et al. do not teach or suggest these organic materials. Havemann et al. teach a structure wherein a parylene (polyparaxylylene) polymer is deposited onto a premetal dielectric layer on a substrate, followed by the deposition of a hydrogensilsesquioxane on top of the parylene. However, parylene is not one of Applicants' claimed organic materials. Accordingly, Havemann does not describe each element of the claimed invention. For these reasons, it is submitted that this ground of rejection has been overcome.

Claims 23-31 stand rejected under 35 U.S.C. 103(a) as unpatentable over Zhao in view of Ross. It is respectfully asserted that the rejection is not well taken. As stated above, due to the filing of the present Continued Prosecution Application, Ross is not available as a reference. Accordingly, it is respectfully submitted that the rejection is improper.

Regarding Zhao individually, it is respectfully submitted that the amended claims are neither taught nor suggested by the reference. Specifically, Zhao does not teach a structure having an inorganic layer which comprises an inorganic dielectric selected from the group consisting of hydrogensiloxanes, inorganic hydrogensilsesquioxanes and combinations thereof; and wherein the hydrogensiloxanes have the formula $[(HSiO_{1.5})_xO_y]_n$, and the hydrogensilsesquioxanes have the formula $(HSiO_{1.5})_n$, wherein $x=$ about 6 to about 20, $y=$ 1 to about 3, and $n=$ 1 to about 4,000.

The Examiner had applied Ross to show the claimed silsesquioxanes. However, as stated above, Ross is not available as a reference. Therefore, it is respectfully asserted that the rejection an improper application of the art.

Further, it is respectfully asserted that Zhao does not teach or describe structures having a first dielectric composition film on a surface of a substrate and a second dielectric composition film on the first dielectric composition film; wherein the first dielectric composition and the second dielectric composition have substantially different etch resistance; wherein either the first dielectric composition film is organic and the second dielectric composition film is inorganic; or the first dielectric composition film is inorganic and the second dielectric composition film is organic; wherein the organic dielectric composition film comprises an organic dielectric selected from the group consisting of applicant's Markush group of organic dielectrics; and wherein the inorganic dielectric composition film comprises an inorganic dielectric selected from the group consisting of hydrogensiloxanes, inorganic hydrogensilsesquioxanes and combinations thereof; and wherein the hydrogensiloxanes have the formula $[(HSiO_{1.5})_xO_y]_n$, and the hydrogensilsesquioxanes have the formula $(HSiO_{1.5})_n$,

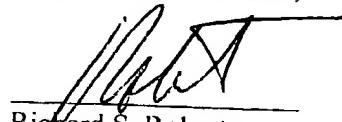
wherein x= about 6 to about 20, y=1 to about 3, and n=1 to about 4,000. Rather, Zhao teaches a patterned and etched silicon dioxide or low-k dielectric on a substrate that is filled with metal to form contacts. A cap layer is then formed on the metal and dielectric material, which cap layer may be a silicon nitride or silicon dioxide. It is respectfully asserted that the claimed invention is significantly different than the structures described in Zhao et al.

It is submitted that the Examiner is reconstructing the art in light of Applicants' disclosure. An invention cannot be deemed unpatentable merely because, in a hindsight attempt to reconstruct the invention, one can find elements of it in the art; it must be shown that the invention as a whole was obvious at the time the invention was made without knowledge of the claimed invention. When selective combination of prior art references is needed to make an invention seem obvious, there must be something in the art to suggest that particular combination other than hindsight gleaned from the invention itself, something to suggest the desirability of the combination. Uniroyal, Inc. v. Rudkin-Wiley Corp., 5 U.S.P.Q.2d 1434, 1438 (CAFC 1988). Such a suggestion is absent in the cited references. Further, for a *prima facie* case of obviousness to be established, the applied prior art must be such that it would have provided one of ordinary skill in the art with both a motivation to carry out the claimed invention and a reasonable expectation of success in doing so. See *In re Vaeck*, 947 F.2d 488, 20 USPQ2d 1438, 1442 (Fed. Cir. 1991); *In re O'Farrell*, 853 F.2d 894, 902, 7 USPQ2d 1673, 1680 (Fed. Cir. 1988). It is respectfully submitted that there is nothing in either Zhao or Zhao in combination with Ross that would lead one skilled in the art to form the claimed invention with a reasonable expectation of success in doing so. For these reasons it is urged that rejection has been overcome and should be withdrawn.

The undersigned respectfully requests re-examination of this application and believes it is now in condition for allowance. Such action is requested. If the examiner believes there is any matter which prevents allowance of the present application, it is requested that the undersigned be contacted to arrange for an interview which may expedite prosecution.

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Respectfully submitted,

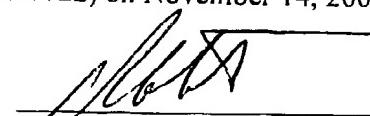


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MARKED-UP COPY OF THE AMENDED CLAIMS

23. (Amended) An integrated circuit structure which comprises a substrate and (a) an organic layer on a surface of the substrate which comprises a pattern of metal lines on the substrate and an organic dielectric on the substrate surface between the metal lines, and wherein the organic dielectric comprises a dielectric selected from the group consisting of alkoxysilane polymers, organic siloxanes, hydroorganosiloxanes, hydrogenmethylsilsesquioxane, hydrogenethylsilsesquioxane, hydrogenpropylsilsesquioxane, hydrogenbutylsilsesquioxane, hydrogen^{tert}-butylsilsesquioxane and hydrogenphenylsilsesquioxane, polyimides, fluorinated and nonfluorinated poly(arylethers), methylated siloxane polymers; polymers having the formulae [(HSiO_{1.5})_xO_y(RSiO_{1.5})_z]_n, [(HSiO_{1.5})_x(RSiO_{1.5})_y]_n and [(HSiO_{1.5})_xO_y(RSiO_{1.5})_z]_n wherein x= about 6 to about 20, y=1 to about 3, z= about 6 to about 20, n=1 to about 4,000, and each R is independently C₁ to C₈ alkyl or C₆ to C₁₂ aryl; organic silicon containing polymers having the formulae

[H-SiO_{1.5}]_n[R-SiO_{1.5}]_m,

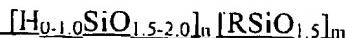
[H_{0.4}-SiO_{1.5-1.8}]_n[R_{0.4-1.0}-SiO_{1.5-1.8}]_m,

[H_{0-1.0}-SiO_{1.5-2.0}]_n[R-SiO_{1.5}]_m,

[H-SiO_{1.5}]_x[R-SiO_{1.5}]_y[SiO₂]_z,

wherein R is selected from substituted and unsubstituted straight chain and branched alkyl groups, cycloalkyl groups, substituted and unsubstituted aryl groups, and mixtures thereof; the sum of n and m, or the sum of x, y and z is from about 8 to about 5000, and m and y are selected such that carbon containing substituents are present in an amount of less than about 40 Mole percent;

organic silicon containing polymers having the formulae:



wherein the sum of n and m is from about 8 to about 5000 and m is selected such that the carbon containing substituent is present in an amount of from about 40 mole percent or greater; and



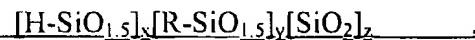
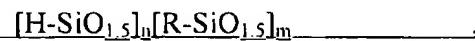
wherein the sum of x, y and z is from about 8 to about 5000 and y is selected such that the carbon containing substituent is present in an amount of about 40 mole % or greater; and wherein R is selected from substituted and unsubstituted straight chain and branched alkyl groups, cycloalkyl groups, substituted and unsubstituted aryl groups, and mixtures thereof, and mixtures thereof; and

(b) an inorganic layer on the organic layer which comprises an inorganic dielectric selected from the group consisting of hydrogensiloxanes, inorganic hydrogensilsesquioxanes and combinations thereof, having metal filled vias therethrough which connect to the metal lines of the organic layer; and wherein the hydrogensiloxanes have the formula $[(\text{HSiO}_{1.5})_x\text{O}_y]_n$, and the hydrogensilsesquioxanes have the formula $(\text{HSiO}_{1.5})_n$, wherein x= about 6 to about 20, y=1 to about 3, and n=1 to about 4,000.

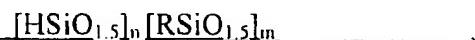
29. (Amended) A dielectric coated substrate which comprises:

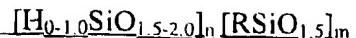
- (a) a first dielectric composition film on a surface of a substrate; and
- (b) a second dielectric composition film on the first dielectric composition film; wherein the first dielectric composition and the second dielectric composition have substantially different etch resistance; wherein either the first dielectric

composition film is organic and the second dielectric composition film is inorganic; or the first dielectric composition film is inorganic and the second dielectric composition film is organic; wherein the organic dielectric comprises a dielectric selected from the group consisting of alkoxy silane polymers, organic siloxanes, hydroorganosiloxanes, hydrogenmethylsilsesquioxane, hydrogenethylsilsesquioxane, hydrogenpropylsilsesquioxane, hydrogenbutylsilsesquioxane, hydrogen*tert*-butylsilsesquioxane and hydrogenphenylsilsesquioxane, polyimides, fluorinated and nonfluorinated poly(arylethers), methylated siloxane polymers; polymers having the formulae $[(HSiO_{1.5})_xO_y(RSiO_{1.5})_z]_n$, $[(HSiO_{1.5})_x(RSiO_{1.5})_y]_n$ and $[(HSiO_{1.5})_xO_y(RSiO_{1.5})_z]_n$ wherein x= about 6 to about 20, y=1 to about 3, z= about 6 to about 20, n=1 to about 4,000, and each R is independently C₁ to C₈ alkyl or C₆ to C₁₂ aryl; organic silicon containing polymers having the formulae



wherein R is selected from substituted and unsubstituted straight chain and branched alkyl groups, cycloalkyl groups, substituted and unsubstituted aryl groups, and mixtures thereof; the sum of n and m, or the sum of x, y and z is from about 8 to about 5000, and m and y are selected such that carbon containing substituents are present in an amount of less than about 40 Mole percent; organic silicon containing polymers having the formulae:





wherein the sum of n and m is from about 8 to about 5000 and m is selected such that the carbon containing substituent is present in an amount of from about 40 mole percent or greater; and



wherein the sum of x, y and z is from about 8 to about 5000 and y is selected such that the carbon containing substituent is present in an amount of about 40 mole % or greater; and wherein R is selected from substituted and unsubstituted straight chain and branched alkyl groups, cycloalkyl groups, substituted and unsubstituted aryl groups, and mixtures thereof, and mixtures thereof; and

wherein the inorganic dielectric composition film comprises an inorganic dielectric selected from the group consisting of hydrogensiloxanes, inorganic hydrogensilsesquioxanes and combinations thereof; and wherein the hydrogensiloxanes have the formula $[(HSiO_{1.5})_xO_y]_n$, and the hydrogensilsesquioxanes have the formula $(HSiO_{1.5})_n$, wherein x= about 6 to about 20, y=1 to about 3, and n=1 to about 4,000.